

## **2.0 Identification of the Remedial Action Objective and Remedial Goal Options**

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### **2.1 Remedial Action Objective**

This chapter identifies the remedial action objective (RAO) for Parcel 94(7) and describes the remedial goal options (RGO) for the site. CERCLA and the EPA National Contingency Plan (NCP) present the procedures for deriving the RAOs used at all Superfund sites. Although FTMC is not currently on the Superfund list and is not proposed for inclusion, the CERCLA guidance was used as a basis for this FFS. RAOs refer to the statutory requirements that should be addressed for all remedial actions at a given site. RAOs are usually as specific as possible without unduly limiting the range of alternatives that can be developed for a detailed feasibility evaluation. RAOs include goals for protecting human health and the environment that are specific to each of the potentially affected environmental media.

An SRA was performed in the RI to determine the threat to human health from exposure to environmental media at Parcel 94(7). The SRA identified four PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene) as COCs in soil based on cancer risk. The PAHs, however, appear to be present from asphalt at the site rather than from site-related releases and will not be considered further in RGO development herein. The SRA also identified VC and TCE as COCs in groundwater based on cancer risk. For the purpose of this FFS, chlorobenzene is also included as a COC in groundwater because its maximum detected concentration (MDC) exceeded its maximum contaminant level (MCL). It will be shown that reducing contaminant concentrations in groundwater to their respective MCLs will yield a total incremental lifetime cancer risk (ILCR) summed across media for residential exposure that falls within but does not exceed the risk management range.

A SLERA was also conducted during the RI activities. The results of the SLERA revealed that none of the constituents in surface soil presents an unacceptable risk to terrestrial ecosystems at FTMC; therefore, the RAO will not include a reference to the overall protection of the environment.

The RAO for Parcel 94(7) is to minimize the potential risk to human receptors associated with the ingestion of groundwater containing elevated COC concentrations, so that the Army can release the site for its intended active recreational reuse. This RAO can be achieved by reducing the potential for groundwater exposure (e.g., through land-use controls [LUC]) and/or by reducing the COC concentrations to specified RGOs through a remedial approach (e.g., in situ chemical oxidation).

1 **2.2 Applicable or Relevant and Appropriate Requirements**

2 CERCLA specifies that remedial actions for the cleanup of hazardous substances must comply  
3 with applicable or relevant and appropriate requirements (ARAR) or standards under federal or  
4 more stringent state environmental laws regarding the hazardous substance or particular  
5 circumstances at a site. The assumption that human health and the environment are protected is  
6 inherent in the interpretation of the ARARs.

7  
8 **2.2.1 Applicable Requirements**

9 The NCP defines applicable requirements as “those cleanup standards, standards of control, and  
10 other substantive requirements, criteria, or limitations promulgated under Federal environmental  
11 or State environmental or facility citing laws that specifically address a hazardous substance,  
12 pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA  
13 site” (EPA, 1991). In addition to laws, ARARs may be regulations or guidance promulgated by  
14 federal or state agencies. Only promulgated state standards that are identified by a state and are  
15 equally or more stringent than federal requirements may be applicable.

16  
17 **2.2.2 Relevant and Appropriate Requirements**

18 The NCP defines relevant and appropriate requirements as “those cleanup standards, standards of  
19 control, and other substantive requirements, criteria, or limitations promulgated under Federal  
20 environmental or State environmental or facility citing laws that, while not ‘applicable’ to a  
21 hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a  
22 CERCLA site, address problems or situations sufficiently similar to those encountered at the  
23 CERCLA site that their use is well suited to the particular site.” As was true for applicable  
24 requirements, the NCP provides that only those promulgated state requirements that are equally  
25 or more stringent than corresponding federal requirements may be relevant and appropriate.

26  
27 **2.2.3 To Be Considered Requirements**

28 To be considered (TBC) requirements pertain to federal and state criteria, advisories, guidelines,  
29 or proposed standards that are not generally enforceable but are advisory; TBCs do not have the  
30 status of potential ARARs. Guidance documents or advisories “to be considered” in determining  
31 the necessary level of cleanup for protection of human health or the environment may be used  
32 where no specific ARARs exist for a chemical or situation or where such ARARs are not  
33 sufficient to be protective.

34  
35 **2.2.4 Identification of ARARs**

36 EPA identifies three basic types of ARARs: chemical-specific, action-specific, and location-  
37 specific.

1  
2 **2.2.4.1 Chemical-Specific ARARs**

3 Chemical-specific ARARs provide protective site cleanup levels or a basis for calculating  
4 cleanup levels for COCs in designated media. Chemical-specific ARARs are also used to  
5 determine treatment and disposal requirements for a particular remedial activity and to assess the  
6 effectiveness of a remedial alternative.

7  
8 Chemical-specific standards for the COCs identified in Section 2.1 have been established under  
9 several federal statutes, including the Safe Drinking Water Act, the Clean Water Act, and the  
10 Clean Air Act. Table 2-1 details the potential chemical-specific ARARs for groundwater at the  
11 site. Table 2-2 lists the Safe Drinking Water Act drinking water standards and the ambient water  
12 quality criteria for the COCs identified in Section 2.1. As shown in this table, the Alabama  
13 drinking water standards are the same as the federal standards (MCLs)

14  
15 **2.2.4.2 Location-Specific ARARs**

16 A remedial action alternative may be restricted or precluded by federal, state, or facility laws  
17 based on its location within a site or its immediate environment. Location-specific ARARs are  
18 designed to protect the local area from potentially damaging remedial actions. For example,  
19 altering the habitat of an endangered species to construct a treatment facility may jeopardize the  
20 survivability of the species. Table 2-3 identifies the federal and state laws that contain  
21 promulgated standards, requirements, criteria, or limitations that will be considered location-  
22 specific ARARs for this FFS.

23  
24 **2.2.4.3 Action-Specific ARARs**

25 Action-specific ARARs are promulgated federal or state laws that set controls or restrictions on  
26 activities related to the management of hazardous materials or pollutants. Table 2-4 lists the  
27 potential federal and state action-specific ARARs for groundwater at Parcel 94(7). Each action-  
28 specific ARAR may not apply to all remedial technologies and process options; therefore, a  
29 description of the applicable remedial technology and/or process option is included in the  
30 comments section of the table.

31  
32 **2.3 Remedial Goal Options**

33 Protection of human health can be achieved by reducing the levels of contaminants in  
34 groundwater at Parcel 94(7) to specified RGOs by a remedial action. RGOs are the  
35 concentrations for individual chemicals in groundwater above which remediation or control  
36 measures would be required. The RGOs for Parcel 94(7) were determined with consideration of  
37 the risk to human health and the ARARs that were identified for the site. The ARARs for Parcel

**Table 2-1**

**Potential Federal and State Chemical-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Standard, Requirement, Or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
<b>Federal</b>			
Safe Drinking Water Act (SDWA), 40 USC Section 300 - National Primary Drinking Water Standards - 40 CFR Part 141	Applicable to the use of public water systems. Establishes maximum contaminant levels (MCL), monitoring requirements, and treatment techniques.	Applicable	Applicable because groundwater is a potential source of drinking water at Fort McClellan.
SDWA, 40 USC Section 300 – Maximum Contaminant Level Goals (MCLG), 40 CFR 143	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects.	To Be Considered	Proposed MCLGs for organic and inorganic contaminants are to be considered for contaminants with no federal and state MCLs.
Clean Water Act, 33 USC Sections 1351-1376 – Water Quality Criteria, 40 CFR Part 131	Sets criteria for water quality based on toxicity to aquatic organisms and human health.	Relevant and Appropriate	The ambient water quality criteria for organic contaminants are relevant and appropriate if the discharge to surface water process option is selected.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601 et. Seq.	Provides for response to hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites.	Relevant and Appropriate	Even though Fort McClellan is not currently on the Superfund list and is not proposed for inclusion, the CERCLA guidance was used as a basis for this focused feasibility study.
Clean Air Act, 40 USC 1857 - National Primary and Secondary Ambient Air Quality Standards, 40 CFR Part 50	Set primary and secondary air standards at levels to protect public health and welfare.	Applicable	Applicable if remedial technologies or process options incorporating vapor-producing treatment components (e.g., in situ or ex situ air stripping) are selected.
Clean Air Act, 40 USC. 1857 - National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61	Provides emissions standards for hazardous air pollutants for which no ambient air quality standards exist.	Applicable	Applicable if remedial technologies incorporating vapor-producing components are selected.
Occupational Safety and Health Act, 29 CFR 1910 Part 120	Provides safety rules for handling specific chemicals for site workers during remedial activities.	Applicable	Applicable to all remedial actions conducted at Fort McClellan sites.

**Table 2-1**

**Potential Federal and State Chemical-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

Standard, Requirement, Or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
<b>State</b>			
Alabama Primary Drinking Water Quality Standards, ADEM 335-7-2	Establishes standards for public water supply systems for households.	Applicable	Applicable because groundwater is a potential source of drinking water at Fort McClellan.
Alabama Secondary Drinking Water Quality Standards, ADEM 335-7-3	Establishes standards for public water supply systems for households.	To Be Considered	Proposed MCLGs for organic and inorganic contaminants are to be considered for contaminants with no federal and state MCLs.
Alabama Ambient Air Quality Standards, ADEM 335-3-1-.03	Establishes applicability of federal primary and secondary air quality standards defined in 40 CFR Part 50 to the State of Alabama.	Applicable	Applicable if remedial technologies incorporating vapor-producing treatment components are selected.

ADEM – Alabama Department of Environmental Management.  
 CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act.  
 CFR – Code of Federal Regulations.  
 MCL – Maximum contaminant level.  
 MCLG – Maximum contaminant level goal.  
 SDWA – Safe Drinking Water Act.  
 USC – United States Code.

**Table 2-2**

**Potential Chemical-Specific ARARs and TBCs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

Chemical	ARARs and TBCs				
	Federal Drinking Water Standards <sup>a</sup>		Alabama Drinking Water Standard <sup>b</sup>	Ambient Water Quality Criteria (WQC) for Protection of Human Health <sup>c</sup>	
	MCL	MCLG		WQC for Aquatic Organisms and Drinking Water	WQC for Aquatic Organisms Alone
Chlorobenzene	0.100	0.100	0.100	0.680	21
TCE	0.005	0	0.005	0.0027	0.081
Vinyl chloride	0.002	0	0.002	0.002	0.525

All values given in milligrams per liter (mg/L).

<sup>a</sup> EPA, 2002, *National Primary Drinking Water Standards*, EPA 811-F-02-013, July.

<sup>b</sup> Alabama primary drinking water standards and secondary maximum contaminant levels are identical to Federal standards for these contaminants.

<sup>c</sup> Federal Ambient Water Quality Criteria for the Protection of Human Health and Freshwater Organisms. Required by the CWA, Section 304(a). Source: EPA National Recommended Water Quality Criteria, 63 FR 68354, December 10, 1998.

ARAR - Applicable or relevant and appropriate requirement.

MCL - Maximum contaminant level.

MCLG - Maximum contaminant level goal.

← TBC - To be considered.

← WQC - Water quality criteria.

Table 2-3

Potential Federal and State Location-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama

(Page 1 of 4)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
<b>Federal</b>			
Safe Drinking Water Act – 40 CFR 149	Sole-source drinking water aquifer designation.	Not Applicable	Parcel 94(7) is not located over a sole-source aquifer.
Floodplain Management – 40 CFR 6.302(b) Executive Order 11988	Federal agencies proposing actions to be located in a floodplain must first evaluate the potential adverse effects those actions might have on the natural and beneficial values served by the floodplain.	Not Applicable	Parcel 94(7) is not located in a floodplain.
Floodplain Management – Resource Conservation and Recovery Act (RCRA); <b>Resource Conservation and Recovery Act Location Standards</b> , 42 USC Section 6901, 40 CFR 264.18(b)	Requires treatment, storage, or disposal facilities (TSDF) facilities to be designated, constructed, operated and maintained to avoid washout on a 100-year floodplain.	Not Applicable	Parcel 94(7) is not located in a floodplain.
Protection of Wetlands – 40 CFR 6.302(a) Executive Order 11990	Federal agencies are directed to avoid construction located in wetlands unless the agency head finds: (1) no practical alternative to such construction, and (2) the proposed action includes all practical measures to minimize harm to wetlands which might results from such use.	Not Applicable	Parcel 94(7) is not located in proximity of wetlands. Construction activities are not expected to affect the wetlands located to the northeast and southeast.

Table 2-3

Potential Federal and State Location-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama

(Page 2 of 4)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
Endangered Species Act 16 USC 1531 50 CFR 200 & 402	Requires Federal agencies to ensure that actions are not likely to threaten the continued existence of endangered/threatened species or adversely modify or destroy the critical habitats of such species.	Applicable	Endangered and threatened species have not been identified in this area; however, Ingram Creek located adjacent to Parcel 94(7) has been identified as a moderate quality foraging area for the Gray Bat ( <i>Myotis grisescens</i> ). The endangered or threatened species such as the Blue Shiner ( <i>Cyprinella caerulea</i> ), Mohr's Barbara Buttons ( <i>Marshallia mohrii</i> ), and Tennessee Yellow-eyed Grass ( <i>Xyris tennesseensis</i> ) have been found in other portions of Fort McClellan. Historically, the Red-cockaded Woodpecker ( <i>Picoides borealis</i> ) has also been observed at Fort McClellan but has not been recorded since 1968. There are no state-protected species. Another candidate species (present within the Mountain Longleaf Community complex) includes the Appalachian Cottontail ( <i>Syvilagus obscurus</i> ). Applicable if endangered/threatened species are encountered at Parcel 94(7).
Fish and Wildlife Coordination Act - 16 USC 661-666 33 CFR 320-330	Sets forth procedures for consultation between regulatory agencies to consider wildlife conservation. Requires any federal agency proposing to modify a body of water to consult with the U.S. Fish and Wildlife Service.	Applicable	Applicable if the discharge to surface water process option is retained.
Wild and Scenic Rivers Act, 16 U.S.C. 1274, 40 CFR 6.302(e)	Restricts activities within areas affecting national wild, scenic, or recreational rivers.	Applicable	Applicable if the discharge to surface water process option is selected and Ingram Creek is identified as a wild, scenic, or study river or stream tributary on the National Rivers Inventory.
Presence of archaeological resources, 43 CFR 7.4(a), 40 CFR 7.5(b)(1), 43CFR 10.4(c), 43 CFR 10.4(d)	Restricts excavating, removing, damaging, or otherwise altering or defacing such resources unless by permit or exception. Protects any such archaeological resources, if discovered. Restricts activities in the area of discovery and requires a reasonable effort be made to protect the objects discovered. Requires consultation with the Indian tribe likely to be affiliated with the objects to determine further disposition per 40 CFR 10.5(b).	Not Applicable	Based on the facility-wide Phase I survey performed, there are no known archaeological or historic resources at Parcel 94(7) or surrounding areas.

Table 2-3

Potential Federal and State Location-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
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(Page 3 of 4)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
National Archaeological and Historical Preservation Act (16 USC Section 469); 35 CFR Part 65	Requires action be taken to recover and preserve artifacts.	Not Applicable	Based on the facility-wide Phase I survey performed, there are no known archaeological or historic resources at Parcel 94(7) or surrounding areas.
American Indian Religious Freedom Act, 42 USC 1996	Requires activities in the area of discovery to be stopped and affected work to be suspended until a compliance strategy is approved.	Not Applicable	Based on the facility-wide Phase I survey performed, there are no known archaeological or historic resources at Parcel 94(7) or surrounding areas.
<b>State</b>			
Alabama Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, ADEM 335-14-5-.02, Hazardous Waste Program	Establishes location standards for facilities located in 100-year floodplains. Forbids placement of any non-containerized or bulk liquid hazardous waste within any salt dome/salt bed, underground mine or cave.	Applicable	Although Parcel 94(7) is not located in a floodplain, Fort McClellan is underlain by dolomite and limestone which are subject to cave formation and sinkhole development. If the ex-situ treatment process options are selected, extracted groundwater may be classified as bulk liquid hazardous waste due to elevated concentrations of hazardous constituents (e.g., TCE).
Alabama Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, ADEM 335-14-6, Hazardous Waste Program	Prohibits placement of any hazardous waste in a salt dome, salt bed formation, underground mine, or cave.	Applicable	Fort McClellan is underlain by dolomite and limestone which are subject to cave formation and sinkhole development. If the ex-situ treatment process options are selected, hazardous waste may be generated (e.g., extracted groundwater, spent activated carbon).
Alabama Permit Requirements for Solid Waste Disposal, ADEM 335-13-4-.01, Water Quality Program	Establishes siting standards for disposal facilities in floodplains. Facilities must comply with wildlife, endangered or threatened species, and critical habitat regulations under the Alabama Water Pollution Control Act and related Federal Standards	Not Applicable	Parcel 94(7) is not located in a floodplain.

**Table 2-3**

**Potential Federal and State Location-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 4)

<b>Standard, Requirement, or Criterion</b>	<b>Requirement</b>	<b>Applicable, Relevant and Appropriate, To Be Considered, Not Applicable</b>	<b>Comments</b>
Alabama Water Quality Criteria, ADEM 335-6-10, Water Quality Program	Requires any federal agency proposing to modify a body of water to consult with the U.S. Fish and Wildlife Service. Establishes antidegradation policy based on water use classifications and potentially impacted wildlife, fish, and aquatic life	Applicable	Applicable if the discharge to surface water process option is selected.

**Table 2-4**

**Potential Federal and State Action-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 5)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
<b>Federal</b>			
Identification and Listing of Hazardous Waste and Sampling and Analysis procedures, 40 CFR Part 261, 40 CFR 136, App. A (SW-846 sampling methods)	Specifies requirements for identifying hazardous wastes under the Resource Conservation and Recovery Act (RCRA). Establishes analytical requirements for testing and evaluating solid, hazardous, and water wastes.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated (e.g., extracted groundwater, spent activated carbon).
Standards Applicable to Generators of Hazardous Waste, 40 CFR Part 262	Establishes standards for generators of hazardous waste under RCRA. Specifies requirements for hazardous waste packaging, labeling, manifesting, record keeping, and accumulation time.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated (e.g., extracted groundwater, spent activated carbon).
Standards Applicable to Transporters of Hazardous Waste, 40 CFR Part 263	Establishes standards for transporters of hazardous waste under RCRA.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). Hazardous waste generated must be transported for disposal.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, 40 CFR Part 264	Establishes minimum national standards that define the acceptable management of hazardous waste for owners and operators of facilities that treat, store, or dispose of hazardous waste under RCRA.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). The ex situ treatment facility may be identified as a hazardous waste treatment and storage facility.
Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, 40 CFR Part 265	Establishes minimum national standards that define the acceptable management of hazardous waste during the period of interim status and until certification of the final closure under RCRA.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). The ex situ treatment facility may be identified as a hazardous waste treatment and storage facility.

**Table 2-4**

**Potential Federal and State Action-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 5)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
Land Disposal Restrictions, 40 CFR 268	Identifies hazardous wastes that are restricted from land disposal.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). The ex situ treatment facility may be identified as a hazardous waste treatment and storage facility.
U.S. Department of Transportation (DOT) Hazardous Materials Transportation Regulations, 49 CFR 171-173 and 177-180	Establishes classification, packaging, and labeling requirements for shipments of hazardous materials.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). Hazardous waste generated must be transported for disposal.
Occupational Safety and Health Act (OSHA), 29 U.S.C. ss. 651-678	Regulates worker health and safety.	Applicable	Applicable to all remedial activities.
EPA Region 4 Standard Operating Procedures (SOP)	Requires monitoring and extraction wells to be constructed and abandoned in accordance with EPA Region 4 SOPs, May 1996.	Applicable	Applicable if monitoring or extraction wells are installed.
Safe Drinking Water Act (SDWA), 40 U.S.C. Section 300 – National Primary Drinking Water Standards - 40 CFR Part 141	Applicable to the use of public water systems. Establishes maximum contaminant level, monitoring requirements, and treatment techniques.	Applicable	Applicable if discharge to surface water process option is selected.
Safe Drinking Water Act (SDWA), 40 U.S.C. Section 300 – Maximum Contaminant Level Goals, 40 CFR 143	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects.	To Be Considered	Proposed MCLGs for organic and inorganic contaminants are to be considered for contaminants with no federal and state MCLs.
Discharge to Offsite Surface Water, 40 CFR 122.26, 122.41, and 122.48	Requires that the selected remedial action must establish a standard of control to maintain surface water quality.	Applicable	Applicable if discharge to surface water process option is selected.
Superfund Amendments and Reauthorization Act (SARA), 42 U.S.C. Section 9801 et. Seq.	Requires the discharge to comply with Federal water quality criteria.	Applicable	Applicable if discharge to surface water process option is selected.

Table 2-4

Potential Federal and State Action-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama

(Page 3 of 5)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
Clean Water Act, 33 U.S.C. Sections 1351-1376 – Best Available Treatment Technology (BATT), 40 CFR 122	Requires use of best available technology economically achievable to control discharge of toxic pollutants to a Publicly Owned Treatment Works (POTW).	Applicable	Applicable if discharge to POTW process option is selected.
Clean Water Act, 33 U.S.C. Sections 1351-1376 – National Pollutant Discharge Elimination System (NPDES) Permit Regulations, 40 CFR 122 Subpart C	Requires use of best available technology economically achievable for toxic pollutants discharged to surface waters. Mandates that the discharge must comply with the EPA-approved Water Quality Management Plan.	Applicable	Applicable if discharge to surface water process option is selected.
Discharge to a Publicly Owned Treatment Works (POTW), 33 USC Section 1317, 40 CFR 403	Establishes list of toxic pollutants and promulgates pretreatment standards for discharge to POTWs.	Applicable	Applicable if the discharge to POTW process option is selected.
Clean Air Act, 40 U.S.C. 1857 – National Primary and Secondary Ambient Air Quality Standards, 40 CFR Part 50	Set primary and secondary air standards at levels to protect public health and welfare.	Applicable	Applicable if remedial technologies incorporating vapor-producing treatment components (e.g., in situ or ex situ air stripping) are selected.
Clean Air Act, 40 U.S.C. 1857 - National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61	Provides emissions standards for hazardous air pollutants for which no ambient air quality standards exist.	Applicable	Applicable if remedial technologies incorporating vapor-producing components are selected.
<b>State</b>			
Alabama Hazardous Waste Management Regulations, ADEM 335-14-1	Establishes standards that define the acceptable management of hazardous waste for owners and operators of facilities that treat, store, or dispose of hazardous waste.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). The ex situ treatment facility may be identified as a hazardous waste treatment and storage facility.

**Table 2-4**

**Potential Federal and State Action-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 5)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
Identification and Listing of Hazardous Waste, ADEM 335-14-2	Requirements for identification of hazardous wastes.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated (e.g., extracted groundwater, spent activated carbon).
Alabama Hazardous Waste Generator Regulations, ADEM 335-14-3	Establishes standards for generators of hazardous waste.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon).
Alabama Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, ADEM 335-14-5, ADEM 335-14-6	Standards and requirements for facilities that treat, store, and dispose of hazardous waste.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon).
Alabama Hazardous Waste Management and Minimization Act, Code of Alabama, Title 22, Chapter 30	Establishes a site-wide program to provide for the safe management of hazardous wastes, including hazardous waste generation, transportation, and land disposal.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). Hazardous waste generated must be transported for disposal.
Alabama Land Disposal Restrictions, ADEM 335-14-9	Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise restricted waste may continue to be land disposed.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). The hazardous waste would require disposal; therefore, these regulations would be applicable.
Alabama Solid Waste Act, Code of Alabama, Title 22, Chapter 27	Establishes site-wide program to provide for the safe management of non-hazardous wastes.	Applicable	Non-hazardous waste may be generated during monitoring or remedial activities.
Alabama Solid Waste Management Regulations, ADEM 335-13-1 through 335-13-8	Establishes minimum criteria for the processing, recycling, transportation, and disposal of solid wastes and the design, location, and operation of solid waste disposal facilities.	Applicable	Non-hazardous waste may be generated, transported, or disposed as part of monitoring or remedial activities.
Alabama Air Emissions Regulations, ADEM 335-3-4	Provides for a coordinated statewide program of air pollution prevention, abatement, and control.	Applicable	Applicable if remedial technologies incorporating vapor-producing treatment components (e.g., in situ or ex situ air stripping) are selected.

**Table 2-4**

**Potential Federal and State Action-Specific ARARs for Groundwater  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
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(Page 5 of 5)

Standard, Requirement, or Criterion	Requirement	Applicable, Relevant and Appropriate, To Be Considered, Not Applicable	Comments
Alabama NPDES Permit Regulations, ADEM 335- 6-6	Establishes rules and procedures for the administration of an NPDES-type permit system for the state. Establishes standards for permit compliance, system operations and maintenance, monitoring and record keeping, and reporting.	Applicable	Applicable if the discharge to surface water process option is selected.
Alabama Water Quality Criteria and Use Classifications Regulations, ADEM 335-6-10	Establishes water quality criteria and uses for lakes and rivers based on toxicity to aquatic organisms and human health and water use classifications and antidegradation policy.	Applicable	Applicable if the discharge to surface water process option is selected.
Indirect Discharge Permits and Pretreatment Rules, ADEM 335-6-5	Establishes list of toxic pollutants and promulgates pretreatment standards for discharge to POTWs and defines the requirements for State Indirect Discharge (SID) permits for discharge to POTWs.	Applicable	Applicable if the discharge to POTW process option is selected.
Alabama Closure and Post-Closure Standards, ADEM 335-14-.07 or 335-15-6-.07	Provides standards for closure and post-closure of hazardous waste management facilities that are either RCRA-permitted or classified under interim status.	Applicable	If the ex situ treatment process options are selected, hazardous waste may be generated and stored (e.g., extracted groundwater, spent activated carbon). The ex situ treatment facility may be identified as a hazardous waste treatment and storage facility.
Alabama Wellhead Protection Program, ADEM 335-7-12	Establishes requirements for the closure or abandonment of groundwater monitoring or extraction wells.	Applicable	Upon achieving the remedial action objective, monitoring and/or extraction wells may require abandonment.
Alabama Groundwater and Underground Injection Control (UIC), ADEM 335-6-8	Details the requirements of the Alabama UIC program.	Applicable	Applicable if the discharge to groundwater or in situ treatment process options are selected.

1 94(7) include federal and State of Alabama regulations and other TBC guidance. RGOs are  
2 provided for groundwater only because the PAHs identified as COCs in soil were attributed to  
3 the presence of large areas of asphalt on the site rather than to site-related releases.  
4

5 The groundwater COCs identified in the RI were VC and TCE. Chlorobenzene also is included  
6 as a COC in this FFS because its MDC exceeded its MCL. VC and TCE were associated with a  
7 resident ILCR higher than the maximum risk management value (i.e., greater than 1E-4)  
8 individually or in combination. As shown in Table 2-5, the RGOs for residuum groundwater at  
9 Parcel 94(7) are equivalent to the MCLs. MCLs were selected as the RGOs because the  
10 groundwater at Fort McClellan could serve as a potential future source of drinking water. A  
11 comparison of the Parcel 94(7) groundwater analytical results to the MCLs is provided on Figure  
12 2-1.  
13

14 Federal and state cleanup standards exist for all the COCs in groundwater at Parcel 94(7).  
15 Federal and state regulations stipulate that risk calculations be completed to determine the total  
16 cancer risk (ILCR) and noncancer hazard index (HI) associated with the COCs at their respective  
17 RGO concentrations. For ILCR calculations, this is accomplished using the cancer-based  
18 groundwater SSSLs for residential exposure provided in Table M-8 of the RI report, because  
19 cancer risk and concentration are linearly related. The cancer-based SSSLs are the  
20 concentrations associated with a cancer risk of 1E-6. Therefore, the cancer risk associated with  
21 the MCL is calculated by multiplying the RGO by 1E-6 and dividing the result by the SSSL.  
22 Calculated ILCRs for the cancer-based COCs in groundwater (i.e., VC and TCE) are presented  
23 in Table 2-6.  
24

25 The total calculated ILCR for residential exposure to groundwater is 4.65E-5, which falls within  
26 the risk management range. This confirms that reducing the concentrations of VC and TCE in  
27 groundwater to their respective MCLs will effectively reduce cancer risk. As noted above, the  
28 presence of PAHs in soil was attributed to asphalt pavement present at the site, and the soil  
29 RGOs developed in the SRA are not refined further in this FFS. The total ILCR associated with  
30 PAHs in soil for the resident was 3.35E-5 (Table M-15 of the RI report). The total ILCR of 8.00  
31 E-5 for the resident summed across soil and groundwater falls within the risk management range.  
32 This exercise shows that reducing groundwater concentrations of VC and TCE to their MCLs  
33 will effectively reduce total cancer risk to the resident, supporting the decision to exclude PAHs  
34 in soil in the process of developing RGOs for Parcel 94(7).  
35

36 As presented in Table M-8 of the RI report, the total HI of 1.08 for the resident exposed to  
37 groundwater is due to four chemicals (chlorobenzene, cis-1,2-DCE, VC, and TCE). Consistent

**Table 2-5**

**Remedial Goal Options for Groundwater COCs  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Chemical</b>	<b>Maximum Detected Concentration</b>	<b>MCL<sup>a</sup></b>	<b>Remedial Goal Option</b>
Chlorobenzene	0.300	0.100	0.100
TCE	0.075	0.005	0.005
Vinyl chloride	0.025	0.002	0.002

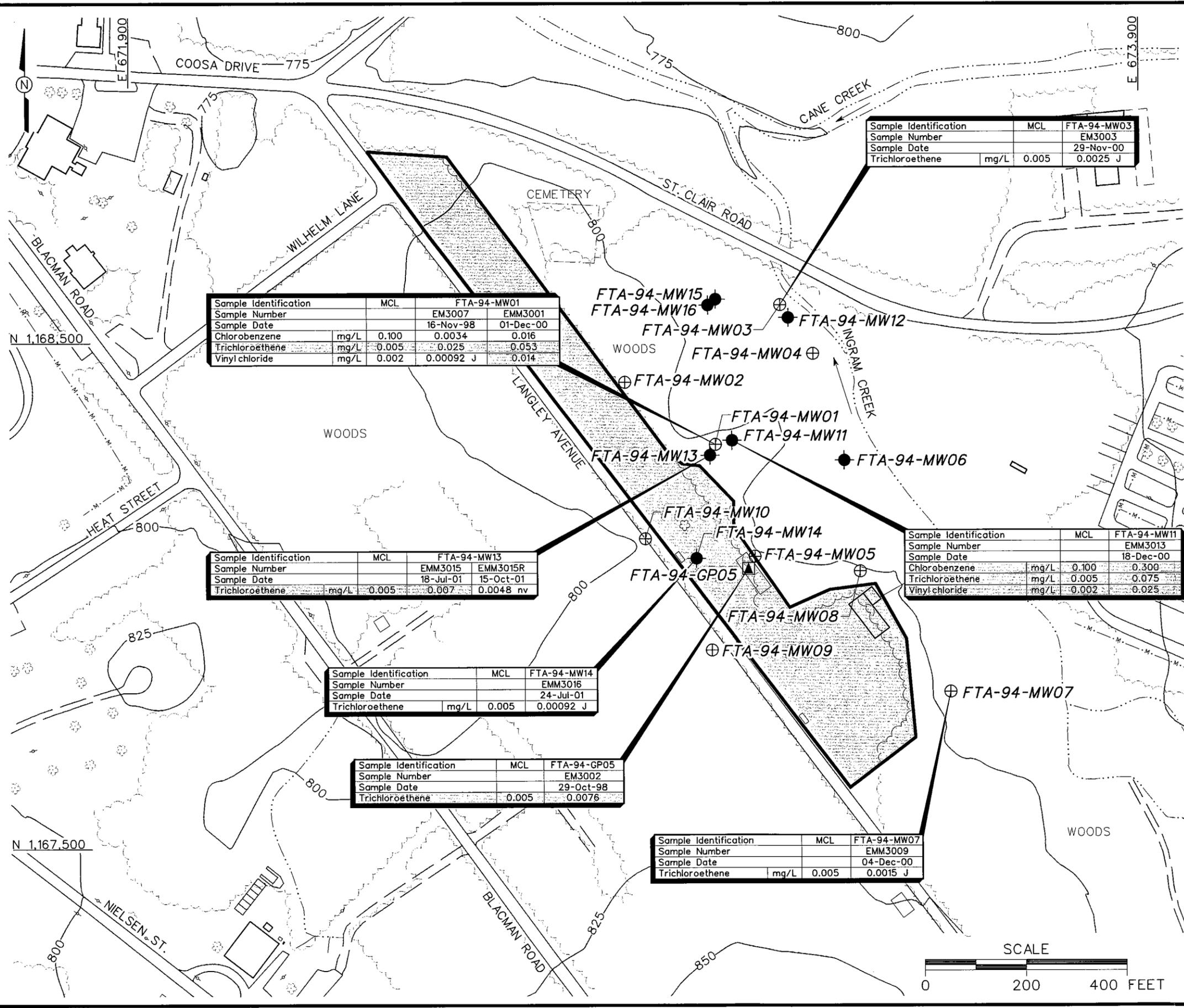
All values given in milligrams per liter (mg/L).

COC - Chemical of concern.

<sup>a</sup> EPA, 2002, *National Primary Drinking Water Standards*, EPA 811-F-02-013, July.

MCL - Maximum contaminant level.

DWG. NO.: \774645es.968  
 PROJ. NO.: 774645  
 INITIATOR: J. MALINO  
 PROJ. MGR.: J. YACOB  
 DRAFT. CHK. BY: S. MORAN  
 ENGR. CHK. BY: S. MORAN  
 DATE LAST REV.:  
 DRAWN BY:  
 STARTING DATE: 12/03/02  
 DRAWN BY: D. BOWMAR  
 01/29/03  
 09:52:25 AM  
 c:\cadd\design\774645es.968



Sample Identification	MCL	FTA-94-MW01	
Sample Number		EM3007	EMM3001
Sample Date		16-Nov-98	01-Dec-00
Chlorobenzene	mg/L 0.100	0.0034	0.016
Trichloroethene	mg/L 0.005	0.025	0.053
Vinyl chloride	mg/L 0.002	0.00092 J	0.014

Sample Identification	MCL	FTA-94-MW13	
Sample Number		EMM3015	EMM3015R
Sample Date		18-Jul-01	15-Oct-01
Trichloroethene	mg/L 0.005	0.007	0.0048 nv

Sample Identification	MCL	FTA-94-MW14	
Sample Number		EMM3016	
Sample Date		24-Jul-01	
Trichloroethene	mg/L 0.005	0.00092 J	

Sample Identification	MCL	FTA-94-GP05	
Sample Number		EM3002	
Sample Date		29-Oct-98	
Trichloroethene	0.005	0.0076	

Sample Identification	MCL	FTA-94-MW07	
Sample Number		EMM3009	
Sample Date		04-Dec-00	
Trichloroethene	mg/L 0.005	0.0015 J	

Sample Identification	MCL	FTA-94-MW03	
Sample Number		EM3003	
Sample Date		29-Nov-00	
Trichloroethene	mg/L 0.005	0.0025 J	

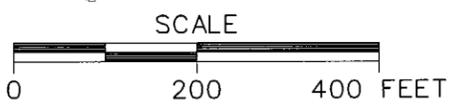
Sample Identification	MCL	FTA-94-MW11	
Sample Number		EMM3013	
Sample Date		18-Dec-00	
Chlorobenzene	mg/L 0.100	0.300	
Trichloroethene	mg/L 0.005	0.075	
Vinyl chloride	mg/L 0.002	0.025	

- LEGEND**
- UNIMPROVED ROADS AND PARKING
  - PAVED ROADS AND PARKING
  - BUILDING
  - TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 25 FOOT)
  - TREES / TREELINE
  - PARCEL BOUNDARY
  - CULVERT WITH HEADWALL
  - SURFACE DRAINAGE / CREEK
  - FENCE
  - UTILITY POLE
  - BEDROCK MONITORING WELL LOCATION
  - RESIDUUM MONITORING WELL LOCATION
  - GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
  - J ESTIMATED CONCENTRATION
  - MCL MAXIMUM CONTAMINANT LEVEL
  - VOC VOLATILE ORGANIC COMPOUND
  - mg/L MILLIGRAMS PER LITER
  - nv NOT VALIDATED
  - CONCENTRATION EXCEEDS MCL

**NOTE:**  
1. "B"-FLAGGED DATA NOT SHOWN.

**FIGURE 2-1**  
CHEMICALS OF CONCERN IN GROUNDWATER FORMER CHEMICAL LAUNDRY AND MOTOR POOL AREA 1500 PARCEL 94(7)

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018



**Table 2-6**

**Incremental Lifetime Cancer Risk for Groundwater RGOs  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Chemical</b>	<b>RGO (mg/L)</b>	<b>SSSL<sup>a</sup> (mg/L)</b>	<b>ILCR</b>
TCE	0.005	0.00451	1.11E-6
Vinyl chloride	0.002	4.41E-5	4.54E-5
<b>Total ILCR for groundwater</b>			<b>4.65E-5</b>

<sup>a</sup> SSSL - Site-specific screening level, based on cancer risk; taken from Table M-7 of the RI report.

ILCR - Incremental lifetime cancer risk.

MCL - Maximum contaminant level.

mg/L - Milligrams per liter.

RGO - Remedial goal option; equivalent to the MCL presented in EPA, 2002, *National Primary Drinking Water Standards*, EPA 811-F-02-013, July.

1 with EPA guidance (1989, 1995), the HI of 1.08 was rounded to 1 to reflect the uncertainty about  
2 risk estimates and was interpreted to mean that the HI did not exceed the threshold level of 1.  
3 Reducing the concentrations of chlorobenzene, VC, and TCE in groundwater, however, would  
4 lower the HI estimate. An exercise similar to that described above for cancer risk is used to  
5 demonstrate that reducing groundwater COC concentrations to their respective MCLs yields a  
6 total HI below the threshold of 1. The noncancer-based SSSLs reflect an HI of 0.1. Calculated  
7 HIs for the COCs in groundwater are presented in Table 2-7. As shown in the table, the total HI  
8 of 0.592 for residential exposure to groundwater is below the threshold level of 1 if COC  
9 concentrations in groundwater are reduced to their respective MCLs.

10

11 In summary, reducing the concentrations of the groundwater COCs to their respective MCLs  
12 would reduce cancer risks to levels within the acceptable risk management range. Regarding  
13 noncancer effects, reducing the groundwater COC concentrations to MCLs would lower the  
14 uncertainty but would not alter the conclusion because no media pose a threat of noncancer  
15 effects.

**Table 2-7**

**Hazard Indices for Groundwater RGOs  
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Chemical</b>	<b>RGO (mg/L)</b>	<b>SSSL<sup>a</sup> (mg/L)</b>	<b>HI</b>
Chlorobenzene	0.080 <sup>b</sup>	0.0162	0.494
TCE	0.005	0.00915	0.0546
Vinyl chloride	0.002	0.00464	0.0431
<b>Total HI</b>			<b>0.592</b>

<sup>a</sup> SSSL - Site-specific screening level, based on noncancer hazard; taken from Table M-7 of the RI report.

<sup>b</sup> The source-term concentration (STC) was used because the RGO exceeds the STC.

HI - Hazard index.

mg/L - Milligrams per liter.

RGO - Remedial goal option; except as noted, equivalent to the MCL as presented in EPA, 2002, *National Primary Drinking Water Standards*, EPA 811-F-02-013, July.